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EXAMINER

LI, SHI K

ART UNIT PAPER NUMBER

2633

DATE MAILED: 06/02/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/751,351

Applicant(s)

KIM ET AL.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,9-11,17 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,9-11,17 and 19-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1-2, 4-6 and 9-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites "link wavelengths" in lines 4 and 8, and through out the rest, of the claim. The specification always uses "user wavelength" and nowhere does the specification mention and define "link wavelength".

3. Claim 1-2, 4-6 and 9-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites "the sub-ring controller using a unique wavelength that is different from the unique wavelength used in the terminal and connection node" in lines 12-14. The specification teaches in page 10, third paragraph that sub-ring controller uses wavelength  $\lambda_i$  (where  $i=1, \dots, [m]$ ) and the user wavelength of terminal  $(i,j)$  is  $\lambda_j$  (where  $j=1, \dots, n$ ). That is, a sub-ring controller and a terminal can use the same wavelength when  $i=j$ , e.g., terminal (2,2) uses

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$\lambda_2$  while sub-ring controller of sub-ring 2 uses  $\lambda_2$  also. Nowhere does the specification teach a unique sub-ring wavelength that is different from terminal user wavelengths.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1-2, 4-6, 9-11, 17 and 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "the terminal" in line 13 of the claim. There is insufficient antecedent basis for this limitation in the claim. Since there are n terminals, it is unclear to which terminal is referred.

7. Claim 1 recites the limitation "the identifying code" in line 25 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 10 recites the limitation "the unit network" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 17 recites the limitation "the n number of terminals" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 22 recites the limitation "the n number of terminals" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 1-2, 9-10, 17 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chawki et al. (U.S. Patent 5,576,875) in view of Sotom et al. (U.S. Patent 5,796,501).

Regarding claim 1, Chawki et al. discloses in FIG. 2a a WDM optical network enabling the transfer of information elements (Internet protocol, see col. 5, lines 43-45) comprising a plurality of sub-rings for connecting a plurality of stations to which unique user wavelength are respectively allocated. FIG. 2a comprises a main ring B0 for connecting a plurality of connection nodes connecting sub-rings. Each sub-ring includes a station head for connecting between the sub-ring and said main ring and controlling the flows of packets transmitted/received inside said sub-ring (e.g., via lasers 1-4 for transmitting and detector P0 for receiving in FIG. 2b) and packets transmitted/received between said sub-ring and said main ring (e.g., via STM1 of FIG. 2b). Chawki et al. teaches in col. 3, line 40-41 that similar structure can be used for B0. That is, signals travel in the main ring and sub-rings in one direction.

The difference between Chawki et al. and the claimed invention is that Chawki et al. fails to teach a main ring controller wherein said terminals and connection nodes each add/drop their own unique wavelength signals, said sub-ring controller and main ring controller drop all the wavelength division multiplexed signals to demultiplex the signals, load each of said signals on their unique user wavelengths of their destination terminals, and then multiplex again said signals to transmit to said sub-ring and main ring, and said sub-ring controller adds the identifying code of the sub-ring to the transmitted packet.

Sotom et al. discloses in FIG. 1 a network controller 1 wherein each node is associated with a receive wavelength  $\lambda_i$  for receiving and with a send wavelength that can be equal to the receive wavelength (col. 3, lines 20-23). Sotom et al. teaches in FIG. 4 that the network

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controller demultiplexes all WDM signals, establishes the correspondences between addresses of the signals and wavelengths for conveying the signals via space switch 16 and then multiplexes again these wavelengths via multiplexer 18 for transmitting to sub ring or main ring (FIG. 6).

Sotom et al. also teaches to add a label for identifying the destination nodes of the message (see col. 1, lines 59-60). One of ordinary skill in the art would have been motivated to combine the teaching of Sotom et al. with the WDM network of Chawki et al. because the controller of Sotom et al. allows communication between any pair of nodes in the ring with minimum number of transmitter for each node while the controller of Chawki et al. requires complicated wavelength scheme (see table 1 of Chawki et al.). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the controller of Sotom et al. in the WDM network of Chawki et al. because the controller of Sotom et al. allows communication between any pair of nodes in the ring with minimum number of transmitter for each node while the controller of Chawki et al. requires complicated wavelength scheme.

Regarding claim 2, Chawki et al. teaches in FIG. 2a that the main ring has 5 connection nodes and B2 and B3 each has 4 terminals and B1 has 3 terminals. Chawki et al. also teaches 4 nodes in FIG. 2b and FIG. 5 and teaches 7 nodes in FIG. 4a and FIG. 4b. However, it is obvious to one of ordinary skill in the art that the number of terminals and the number of connection nodes depend on the network geographic area and the number of subscribers and can be the same for certain deployment.

Regarding claims 9, 17, 19-21, Sotom et al. includes in FIG. 4 detector 19 and decoder 20 for extracting and reading information from  $\lambda$ -tag, space switch 16 for routing the packets according to the  $\lambda$ -tag, buffer memory 15 for storing packets, re-synchronization circuit 24 and

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generator 26 for restoring the  $\lambda$ -tag, and wavelength converters (equivalent to the transmitters of instant claim) for converting the packets into optical signal wavelengths.

Regarding claim 10, Sotom et al. teaches in FIG. 6 to extend the network horizontally by connecting two main rings via a gateway controller as illustrated in FIG. 7 of Sotom et al.

Regarding claims 22-23, the modified WDM network of Chawki et al. and Sotom et al. uses a protocol for communication between two terminals wherein user wavelengths are assigned to terminals such that user wavelength is unique within a ring, said terminals each adds/drops its own wavelength and a ring controller drops all wavelengths and loads packets to wavelengths assigned to their destination terminals. Terminals belong to two different sub-rings may be assigned the same user wavelength.

13. Claims 4 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chawki et al. and Sotom et al. as applied to claims 1-2, 9-10, 17 and 19-23 above, and further in view of Ball (U.S. Patent 6,020,986).

Chawki et al. and Sotom et al. have been discussed above in regard to claims 1-2, 9-10, 17 and 19-23. The difference between Chawki et al. and Sotom et al. and the claimed invention is that Chawki et al. and Sotom et al. do not teach wavelength coupler for adding/dropping only the assigned wavelength. Ball teaches in FIG. 4 a wavelength coupling device for adding/dropping a wavelength. The device comprises an input circulator, a fiber Bragg grating and an output circulator. One of ordinary skill in the art would have been motivated to combine the teaching of Ball with the modified WDM network of Chawki et al. and Sotom et al. because fiber Bragg grating is inexpensive and has low loss. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the wavelength add/drop

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coupling device of Ball in the modified WDM network of Chawki et al. and Sotom et al. because fiber Bragg grating is inexpensive and has low loss.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chawki et al. and Sotom et al. as applied to claims 1-2, 9-10, 17 and 19-23 above, and further in view of Livermore et al. (U.S. Patent 6,542,511 B1).

Chawki et al. and Sotom et al. have been discussed above in regard to claims 1-2, 9-10, 17 and 19-23. The difference between Chawki et al. and Sotom et al. and the claimed invention is that Chawki et al. and Sotom et al. do not teach intermediate rings. Livermore et al. teaches in FIG. 13 a hierarchical structure with three domains: central domain (main ring), middle domain (intermediate ring) and side domain (sub-ring). One of ordinary skill in the art would have been motivated to combine the teaching of Livermore et al. with the modified WDM network of Chawki et al. and Sotom et al. because such a hierarchical structure simplifies address scheme and routing scheme for large network. Hierarchical address scheme is well known in the art, e.g., IP address scheme, postal address scheme or telephone numbering scheme. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to expand the modified WDM network of Chawki et al. and Sotom et al. by adding intermediate rings, as taught by Livermore et al., and use hierarchical address scheme for routing signals because such a hierarchical structure simplifies address scheme and routing scheme for large network.

*Allowable Subject Matter*



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15. Claims 5-6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

16. Applicant's arguments filed 5 March 2004 have been fully considered but they are not persuasive.

First, the applicant argues against the references individually. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The applicant then argues that the references Chawki et al. and Sotom et al., taken alone or in any combination thereof, fail to show certain features of applicant's invention. It is noted that the features upon which applicant relies (i.e., increasing the number of main nodes by using the  $\lambda$ -tag identifying code if necessary) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamoto (U.S. Patent 6,044,076) teaches in FIG. 14 a scheme for tagging wavelengths used in routing a packet.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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